

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the Application.

Deletions are ~~struck through~~ and additions are underlined.

1. (Currently amended) An inactive Ca^{2+} /calmodulin-dependent protein kinase II α (CaMKII α) knockin nonhuman animal, wherein a CaMKII α gene of one or both of homologous chromosomes is substituted into an inactive type so that an inactive CaMKII α , which has at least one amino acid residue modified in the catalytic domain of CaMKII α , is expressed[[,]]; and thereby a protein kinase activity of ~~the~~ CaMKII α is specifically impaired while a calmodulin binding capacity of ~~the~~ CaMKII α and a capacity of multimerizing subunits are maintained, and wherein the inactive CaMKII α knockin nonhuman animal is produced by a gene targeting method.

2. (Previously presented) The inactive CaMKII α knockin nonhuman animal of claim 1, wherein the inactive CaMKII α knockin nonhuman animal's brain nucleus accumbens has lower neuronal activity as compared to that of a wild-type, while there is no substantial difference in neuronal activities in the cerebral cortex and corpus striatum as compared to those of the wild-type.

3 - 4. (Canceled)

5. (Withdrawn – Currently amended) The inactive CaMKII α knockin nonhuman animal of claim ~~4~~ 1, wherein at least one ~~or a plurality of~~ amino acid residues that is required for binding to ATP has been modified.

6. (Withdrawn) The inactive CaMKII α knockin nonhuman animal of claim 5, wherein a lysine residue that is required for binding to ATP has been modified.

7. (Currently amended) The inactive CaMKII α knockin nonhuman animal of claim ~~2~~ 1, wherein the inactive CaMKII α knockin nonhuman animal is a rodent animal.

8. (Previously presented) The inactive CaMKII α knockin nonhuman animal of claim 7, wherein the inactive CaMKII α knockin nonhuman animal is a mouse.

9. (Currently amended) An inactive Ca²⁺/calmodulin-dependent protein kinase II α (CaMKII α) knockin cell, wherein a CaMKII α gene of one or both of homologous chromosomes is substituted into an inactive type so that an inactive CaMKII α , which has at least one amino acid residue modified in the catalytic domain of CaMKII α , is expressed[[,]]; and thereby a protein kinase activity of ~~the~~ CaMKII α is specifically impaired while a calmodulin-binding capacity of ~~the~~ CaMKII α and a capacity of multimerizing subunits are maintained, and wherein the inactive CaMKII α knockin cell is produced by a gene targeting method.

10 - 13. (Canceled)

14. (Withdrawn) The inactive CaMKII α knockin nonhuman animal of claim 5, wherein the inactive CaMKII α knockin nonhuman animal is a rodent animal.

15. (Withdrawn) The inactive CaMKII α knockin nonhuman animal of claim 14, wherein the inactive CaMKII α knockin nonhuman animal is a mouse.

16. (Withdrawn) The inactive CaMKII α knockin nonhuman animal of claim 6, wherein the inactive CaMKII α knockin nonhuman animal is a rodent animal.

17. (Withdrawn) The inactive CaMKII α knockin nonhuman animal of claim 16, wherein the inactive CaMKII α knockin nonhuman animal is a mouse.

18. (New) The inactive CaMKII α knockin nonhuman animal of claim 1, wherein the lysine residue adjacent to the ATP-binding site in the catalytic domain of CaMKII α has been substituted with an amino acid residue that is not lysine.
19. (New) The inactive CaMKII α knockin nonhuman animal of claim 18, wherein the amino acid residue is selected from the group consisting of alanine, histamine, methionine and arginine.
20. (New) The inactive CaMKII α knockin nonhuman animal of claim 18, wherein the lysine residue adjacent to the ATP-binding site in the catalytic domain is Lys-42.
21. (New) The inactive CaMKII α knockin cell of claim 9, wherein the lysine residue adjacent to the ATP-binding site in the catalytic domain of CaMKII α has been substituted with an amino acid residue that is not lysine.
22. (New) The inactive CaMKII α knockin cell of claim 21, wherein another amino acid residue is selected from the group consisting of alanine, histamine, methionine and arginine.
23. (New) The inactive CaMKII α knockin cell of claim 21, wherein the lysine residue adjacent to the ATP-binding site in the catalytic domain is Lys-42.